

## **After Mild COVID-19 Human Challenge Study Reveals Lasting Cognitive Decline**

A team of researchers from the United Kingdom examined the cognitive deficits associated with [severe acute respiratory syndrome coronavirus 2](#) (SARS-CoV-2) infections. They conducted the first human challenge study among a prospectively controlled group of unvaccinated SARS-CoV-2 naive volunteers, who were inoculated with the wild-type strain and observed for long-term cognitive problems.



### **Study**

In the present study, the researchers challenged a group of unvaccinated, SARS-CoV-2 naive volunteers with the wild-type strain of the virus in controlled conditions. The volunteers were then quarantined and followed up to determine the long-term cognitive impacts of [COVID-19](#).

The researchers ensured that all the [ethical guidelines](#) were followed in this human challenge study, and written consent was obtained from all the volunteers, who were also compensated for the time spent in quarantine.

The study enrolled 36 healthy adults between 18 and 30 years who had never been vaccinated against or infected with SARS-CoV-2. Of these, 18 participants were classified as infected, while 16 were uninfected. The volunteers underwent extensive tests and screening, including blood tests, chest radiography, [body mass index](#), and assessments for COVID-19 risk factors.

The participants were then intranasally inoculated with SARS-CoV-2 and quarantined for at least two weeks. The follow-ups occurred at non-regular intervals for up to a year after the [inoculation](#).

The viral loads in all the infected participants were monitored twice a day through naso- and oropharyngeal swabs. Additionally, the researchers administered a subjective symptom survey thrice daily to track the symptoms. The participants were categorized based on whether they experienced a sustained viral infection, and six were administered [remdesivir](#) as a precaution.

The researchers measured the participants' cognitive performance through 11 computer-based tasks that measured various cognitive domains, such as reaction time, [memory](#), spatial reasoning, and planning. The participants were required to perform these tasks at baseline, on each day of the quarantine, and at each of the five follow-ups. The primary cognitive measure was the baseline-corrected global cognitive composite score or bcGCCS.

Additionally, the researchers also analyzed the levels of brain injury markers, such as [neurofilament light](#) (NfL) and glial fibrillary acidic protein (GFAP), in the blood samples obtained from the participants.

## **Findings**

The study found that bcGCCS scores indicated that the infected individuals exhibited significant cognitive deficits compared to the [uninfected individuals](#). These deficits were sustained for almost a year, with no recovery or improvements noted. Despite these objective cognitive deficits, none of the infected volunteers reported subjective cognitive symptoms.

The cognitive area that showed the largest deficit was memory-related tasks, such as those measuring immediate and delayed [memory recall](#). The infected individuals performed worse than the uninfected ones on memory-related and executive planning tasks.

The cognitive tasks were grouped based on whether learning effects were observed across sessions, and the results indicated that the cognitive differences between the uninfected and infected individuals were robust even after accounting for [learning effects](#).

Furthermore, some brain injury biomarkers in the [serum](#), such as GFAP, were higher in the infected participants than in the uninfected ones, but other markers, such as Tau and NfL, were not significantly different between the two groups.

Although these findings indicated that SARS-CoV-2 [infections](#) resulted in measurable differences in various aspects of cognitive decline, especially in the areas of memory and executive function, the statistical tests revealed no significant correlation between cognitive deficits and viral load, brain markers, and symptom severity.

## **Conclusion**

The study indicated that while objective and measurable changes could be observed in various aspects of cognitive performance due to SARS-CoV-2 infections, further research is essential to understand the [biological mechanisms](#) behind these cognitive deficits. The researchers believe that more long-term studies on larger cohorts are required to understand the long-term impact of COVID-19. Importantly, the study results suggest that these cognitive changes might persist even in the absence of subjective symptoms, highlighting the need for more sensitive assessment tools.

## **Source:**

<https://www.news-medical.net/news/20240923/Human-challenge-study-reveals-lasting-cognitive-decline-after-mild-COVID-19.aspx>